



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,768	09/22/2000	Yasuo Kobayashi	08038.0043	8178

22852 7590 06/03/2004

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER

MOORE, KARLA A

ART UNIT PAPER NUMBER

1763

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 09/667,768	Applicant(s) KOBAYASHI ET AL.	
	Examiner Karla Moore	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-9 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) 8,9 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-4,6-7,12-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. Claims 1, 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,913,929 to Moleshi et al. in view of U.S. Patent No. 6,300,600 to Ratliff et al.
2. Moleshi et al. disclose the invention substantially as claimed and comprising a processing apparatus capable of removing an oxide from a surface of an object to be processed, the processing apparatus comprising: a processing container (10) accommodating the object to be processed therein; an active gas species generating unit (20) for producing active gas species; a heater (36) arranged outside the processing container to heat the object to be processed; a transparent window (42) formed in the processing container between the heater and the object to be processed, the transparent window sheltering the interior of the processing chamber from the outside in an airtight manner (column 4, row 16) and also allowing heating energy from the heater to pass through.
3. However, Moleshi et al. fail to teach a movable shielding plate provided in a gap between the transparent window and the object configured to shield the object from heat radiation from the transparent window, the shielding plate being extractable from and insertable into the gap; wherein, on the condition that the shielding plate is inserted between the object and the transparent window so as to prevent heat a heat stored in the transparent window during a former heating process from being transferred from the transparent window to the object, the processing apparatus is capable of allowing an oxide film formed on the surface of the object to react with the active gas species under unheated condition; thereby forming a product film; and subsequently on condition that the shielding plate is extracted from the gap between the object and the transparent window so as to apply irradiation heat irradiated from the heater to the product film through the transparent window, the processing apparatus is capable of allowing heating a product film to a predetermined temperature for vaporization thereby removing a product film.
4. Ratliff et al. teach the use of a shutter provided in a gap between a transparent window (26) and an object (28) inside a processing apparatus for the purpose of thermal isolation between a heating source (20) and the object to be processed. The shutter provides isolation when the object is in a lower portion of the apparatus (10). See Figures 1A and 1B; column 6, rows 20-56 and column 8, rows 47-51).

Art Unit: 1763

The ability of the shutter to provide thermal isolation allows multiple, varied processes to be performed in a single apparatus. Thus, the presence of the shutter addresses a concern presented not only in Ratliff, but also in the presently claimed invention and Moelshi et al.

5. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a movable shielding plate in a gap between a transparent window and an object to be processed in Moleshi et al. in order to provide thermal isolation that enables multiple processes to be conducted in a single chamber as taught by Ratliff et al.

6. With respect to the method limitations recited in claim 1, Examiner realizes that the prior art fails to teach the claimed inventions intended use of the apparatus. However, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). In the presently claimed invention all of the structural limitations are taught by the prior art and the prior art would be capable of Applicant's intended use.

7. Claim 3 is drawn to a chemical species for an intended use of the apparatus, the courts have ruled that expressions relating an apparatus to the contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

8. Additionally, with respect to claim 12, which is drawn to an intended method of use the apparatus, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Art Unit: 1763

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moleshi et al. and Ratliff et al. as applied to claims 1, 3 and 12 above, and further in view of U.S. Patent No. 5,624,499 to Mizuno et al.

12. Moleshi et al. and Ratliff et al. disclose the invention substantially as claimed and as described above.

13. However, Moleshi et al. and Ratliff et al. fail to teach a shielding plate provided with a cooler for cooling the shielding plate itself.

14. Mizuno et al. teach cooling a shielding structure within a processing apparatus for the purpose of keeping the structure at a temperature where a film deposition rate is so low that deposition on the shield and the resulting contamination particles are prevented (column 15, rows 54-61).

15. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a cooler for cooling the shielding plate Moleshi et al. and Johnsgard et al. in order to prevent unwanted deposition and unwanted deposition particles within the chamber as taught by Mizuno et al.

16. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moleshi et al. in view of Ratliff et al. as applied to claims 1, 3 and 12 above, and further in view of U.S. Patent No. 4,952,273 to Popov and U.S. Patent No. 5,830,310 to Doi.

17. Moleshi et al. and Ratliff et al. disclose the invention substantially as claimed and as described above.

18. However, Moleshi et al. and Ratliff et al. fail to disclose the apparatus further comprising a plasma generating tube, a plasma gas introducing part, a NF₃ gas supplying part, a microwave generating source or a waveguide.

19. Popov teaches the use of a plasma generating tube (50) for the purpose of controlling the size, shape and density of the plasma stream at the sample and to deliver the plasma to the sample without interfering with adjacent equipment (column 4, rows 52-56); a plasma gas introducing part (58) for the purpose of injecting input gases into the source chamber (column 4, rows 64-66).

Art Unit: 1763

20. Doi teaches the use of a processing apparatus further comprising a NF3 gas supplying part (18) for the purpose of introducing a gas for in-situ cleaning processing (column 5, rows 29-32).

21. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plasma generating tube in Moleshi et al. and Ratliff in order to control the size, shape and density of the plasma stream at the sample and to deliver the plasma to the sample without interfering with adjacent equipment as taught by Popov et al. and to additionally provide a plasma introducing part in Moleshi et al. and Ratliff in order to inject the gases in to the source chamber as taught by Popov et al.

22. It would have been further obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a NF3 gas supplying part in Moleshi et al. and Ratliff in order to introduce a gas for in-situ cleaning processing as taught by Doi.

23. With respect to claim 7, Popov teaches the use of a wave magnetron for the purpose of generating microwaves (column 3, rows 44-47) and a waveguide for delivering the microwaves to the chamber (abstract).

24. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a wave magnetron and a waveguide in Moleshi et al. and Ratliff in order to generate microwaves and deliver microwaves, respectively, as taught by Popov.

25. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moleshi et al. and Ratliff et al. as applied to claims 1, 3 and 12 above, and further in view of U.S. Patent No. 5,041,719 to Harris et al. and U.S. Patent No. 4,952,299 to Chrisos et al.

26. Moleshi et al. and Ratliff et al. disclose the invention substantially as claimed and as described above.

27. However, Moleshi et al. and Ratliff et al. fail to teach the shielding plate connected to a shaft or a driver arranged outside the processing container for driving the shaft.

28. Harris et al. disclose a shield (37) attached to a shaft (41) and a driver (42) outside the processing apparatus for the purpose of manipulating the shield between a position where it is inserted or extracted (column 6, rows 58-66).

Art Unit: 1763

29. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a shaft and driver in Moleshi et al. and Ratliff et al. in order to insert and extract the shielding plate as taught by Harris et al.

30. Moleshi et al., Ratliff et al. and Harris et al. disclose the invention substantially as claimed and as described above.

31. However, Moleshi et al. and Ratliff et al. and Harris et al. fail to teach a seal for airtight sealing between the shaft and a wall of the processing chamber.

32. Chrisos et al. teach the use of a ferrofluidic seal for sealing a shaft and a wall of a processing chamber for the purpose of maintaining vacuum integrity within the vacuum chamber (abstract).

33. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a seal for sealing the shaft and a wall of the processing chamber in Moleshi et al., Ratliff et al. and Harris et al. in order to maintain the vacuum integrity of the vacuum chamber as taught by Chrisos et al.

Response to Arguments

34. Applicant's primary arguments with respect to the rejections using Moleshi et al. and Johnsgard et al. have been considered but are moot in view of the new ground(s) of rejection. New art (Ratliff et al.) has been cited to account for the amendments to the claims, which further specify the apparatus comprising: a movable shielding plate provided in a gap between the transparent window and the object configured to shield the object from heat radiation from the transparent window, the shielding plate being extractable and insertable into the gap.

35. However, with respect to Applicant's argument that one of ordinary skill in the art would have no reason to provide a shutter to thermally isolate the water-cooled window of Moleshi et al., Examiner points out that the inclusion of this structure would not preclude one from including back-up and/or alternate means in the apparatus for preventing radiation from reaching the substrate, when it is so desired.

Art Unit: 1763

Conclusion

36. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 571.272.1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

km
28 May 2004


Parviz Hassanzadeh
Primary Examiner
Art Unit 1763